XSEDE Overview
March 2019

XSEDE
Extreme Science and Engineering Discovery Environment

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Manager, XSEDE Broadening Participation Program

Code of Conduct

- XSEDE has an external code of conduct for XSEDE sponsored events which represents XSEDE's commitment to providing an inclusive and harassment-free environment in all interactions regardless of gender, sexual orientation, disability, physical appearance, race, or religion. The code of conduct extends to all XSEDE-sponsored events, services, and interactions.
- **Code of Conduct:** https://www.xsede.org/codeofconduct
- Contact:
  - Event organizer: XSEDE Community Engagement & Enrichment
  - XSEDE ombudspersons:
    - Linda Akli, Southeastern Universitites Research Association, (akli@sura.org)
    - Lizanne Destefano, Georgia Tech (lizanne.destefano@ceismc.gatech.edu)
    - Ken Hackworth, Pittsburgh Supercomputing Center, (hackworth@psc.edu)

What is XSEDE?

Foundation for a National CI Ecosystem

- Comprehensive suite of advanced digital services that federates with other high-end facilities and campus-based resources

Unprecedented Integration of Diverse Advanced Computing Resources

- Innovative, open architecture making possible the continuous addition of new technology capabilities and services

XSEDE Leadership

Partnership led by

NCSA PSC TACC SDSC

Partners who strongly complement these CI centers with expertise in science, engineering, technology and education

SURA Southeastern Universities Research Association	The Shodor Education Foundation, Inc.	NICS	OU	Oklahoma State University
Ohio Supercomputer Center An OH·TECH Consortium Member	Purdue University	University of Arkansas	USC University of Southern California	NCAR
The University of Chicago	Indiana University	Cornell University	Georgia Tech	The University of Georgia

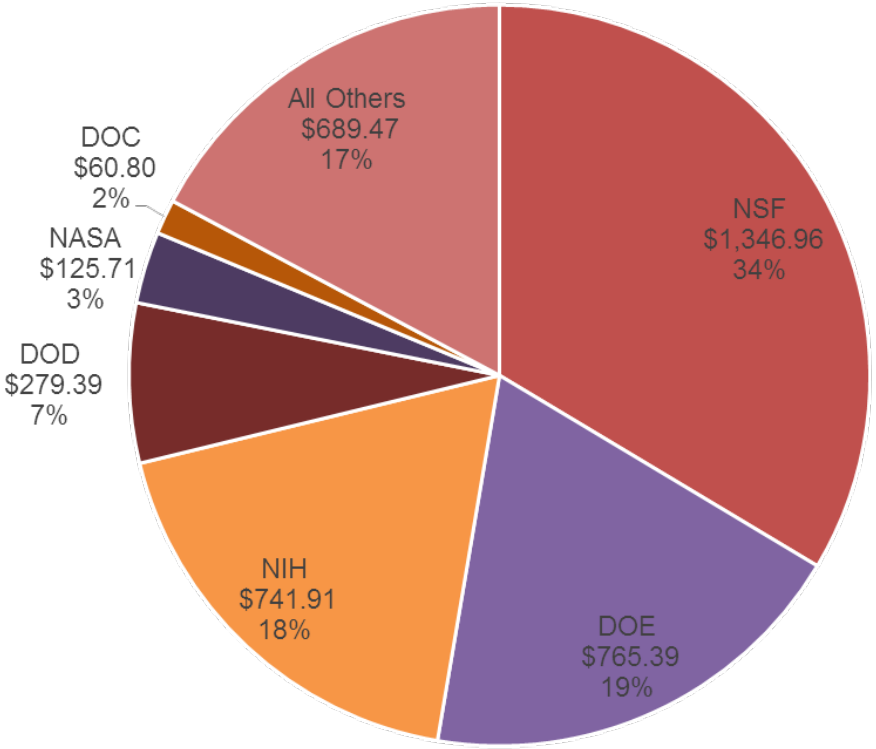
Mission and Goals

Mission: Accelerate scientific discovery

Strategic Goals:

- **Deepen and Extend Use**
  - Raise the general awareness of the value
  - Deepen the use and extend use to new communities
  - Contribute to the preparation of current and next generation scholars, researchers, and engineers
- **Advance the Ecosystem**
- **Sustain the Ecosystem**

Research Funding Supported by XSEDE, 2011-2018



Agency $ Amounts in Millions

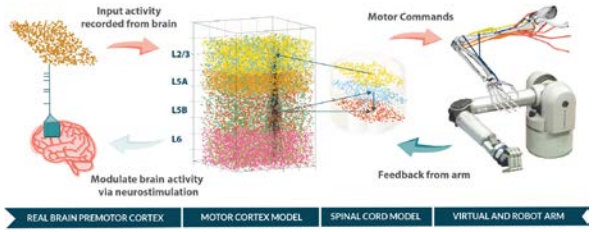
Total 4 Billion

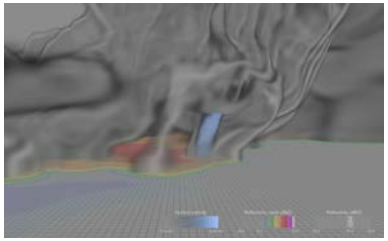
- The chart shows the total user-reported supporting grant funding, by agency, on XSEDE-allocated projects with resource activity. Dollar amounts in chart are $million.
- Where possible, grant information for NSF awards is taken from NSF Award Search.
- Supporting grants listed by multiple projects are counted ONCE using the average of the dollar values provided.

XSEDE Supports a Breadth of Research

- Earthquake Science
- Molecular Dynamics
- Nanotechnology
- Plant Science
- Storm Modeling
- Epidemiology
- Particle Physics
- Economic Analysis of Phone Network Patterns
- Large Scale Video Analytics (LSVA)
- Library Collection Analysis

Replicating Brain Circuitry to Direct a Realistic Prosthetic Arm



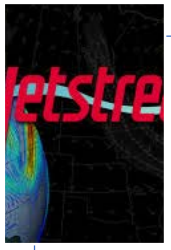


XSEDE researchers visualize massive Joplin, Missouri tornado

Compute and Analytics Resources

Bridges: Featuring interactive on-demand access, tools for gateway building, and virtualization.

Comet: hosting a variety of tools including Amber, GAUSSIAN, GROMACS, Lammps, NAMD, and VisIt.



Jetstream: A self-provisioned, scalable science and engineering cloud environment

Stampede-2: Intel's new innovative MIC technology on a massive scale

Super Mic: Equipped with Intel's Xeon Phi technology. Cluster consists of 380 compute nodes.

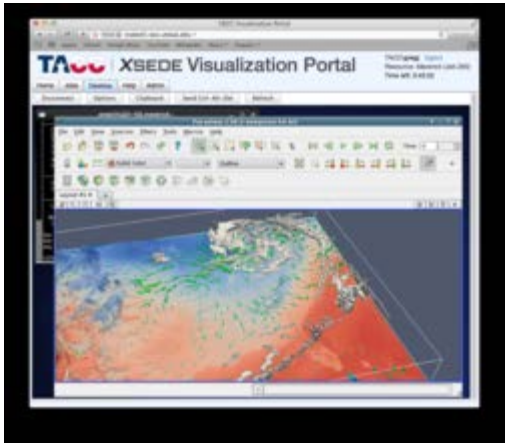
Wrangler: Data Analytics System combines database services, flash storage and long-term replicated storage, and an analytics server. IRODS Data Management, HADOOP Service Reservations, and Database instances.

XSEDE Visualization and Data Resources

Remote Visualization

TACC Visualization Portal

- Remote, interactive, web-based visualization
- iPython / Jupyter Notebook integration
- R Studio Integration



Storage

- **Resource file system storage**:

  All compute/visualization allocations include access to limited disk and scratch space on the compute/visualization resource file systems to accomplish project goals

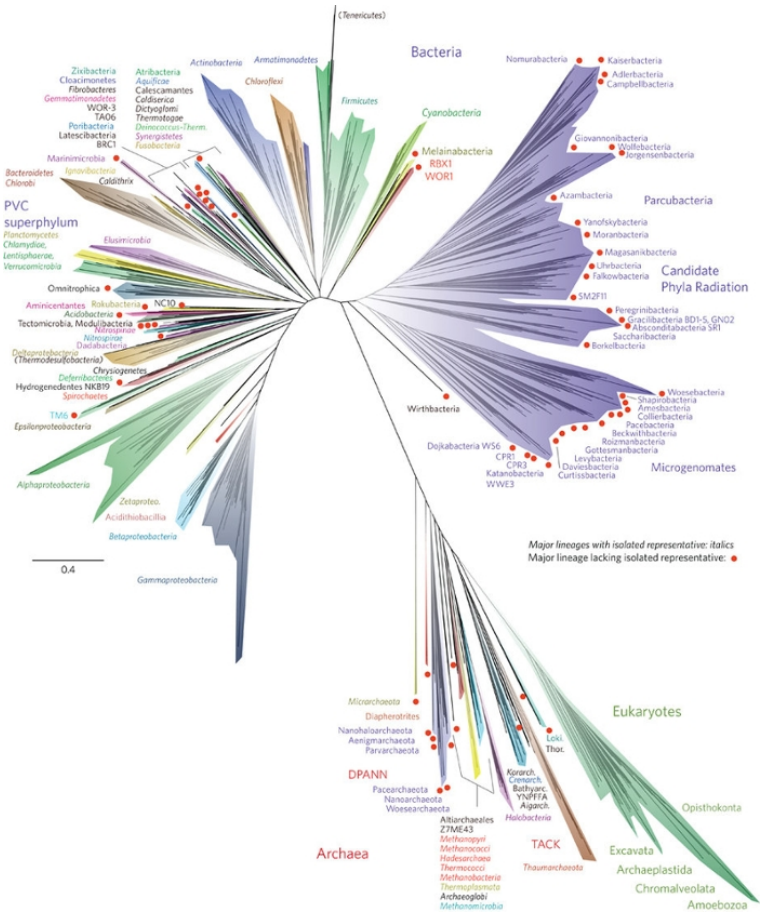
- **Archival Storage**:

  Archival storage on XSEDE systems is used for large-scale persistent storage requested in conjunction with compute and visualization resources.

- **Stand-alone Storage**:

  Stand-alone storage allows storage allocations independent of a compute allocation.

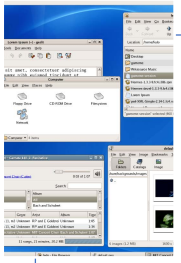
Science Gateways



The CIPRES science gateway: A NSF investment launching thousands of scientific publications with no sign of slowing down.

https://sciencenode.org/feature/cipres-one-facet-in-bold-nsf-vision.php?clicked=title

XSEDE User Support Resources



Technical information

Training

Help Desk/Consultants

Extended Collaborative Support Service

Community Engagement & Enrichment (CEE)

- Broadening Participation
- Campus Engagement
- User Engagement
- User Interfaces & Online Information
- Workforce Development

XSEDE Broadening Participation

- Campus Visits
- Community Listserv
- Conference Exhibiting
- Consulting
- Travel Support
- Training Events

XSEDE

Workforce Development: Education Program

Develop, identify, & maintain computational science program competencies

Promote computational science

Provide consulting for program development and plans

Facilitate Collaborative Online Courses

Workforce Development: Student Programs

Advanced Computing for Social Change and Compute4Change

Empower (Expert Mentoring Producing Opportunities for Work, Education, and Research)

Student Champions

EMPOWER

- **PROJECTS:** Computational, Data Analytics, Visualization, Networking and System Maintenance
- **MENTORS** are XSEDE staff, researchers, and educators who recruit and mentor students.
- **STUDENTS** are undergraduates who participate as a learner, apprentice or intern
- **COMPENSATION:** Ranges from $750 to $3,000 (based on student level and duration)
- **Project proposals** from mentors must contain a training plan for the student.

Workforce Development: Training

- XSEDE Training Course Catalog with all materials in a single location
- Course Calendar for viewing a listing of and registering for upcoming training events and a registration
- Online Training on materials relevant to XSEDE users
- Badges available for completing selected training
- Some events provide participation documentation
- Training Roadmaps

PEARC19

pearc19.pearc.org

Rise of the Machines (Learning)

July 28 - Aug 1, 2019 Chicago, IL

Faculty Opportunities

- Use XSEDE Resources for research or teaching
- Attend a webinar or in-person training
- Use online training materials (XSEDE and HPC University)
- Participate in a faculty development workshop
- Attend PEARC19, July 28th – Aug 1st, https://www.pearc19.pearc.org/

Student Opportunities

- Attend a training event – webinar or in-person
- Present a Poster or Visualization at PEARC19
- Apply to XSEDE's Empower Student Internship Program
- Participate in the Advanced Computing for Social Change @PEARC19
- Participate in Compute4Change @SC19, Denver, Nov 17th – 22nd
- Visit HPC University for more student opportunities. www.hpcuniversity.org

More Information

Linda Akli, akli@sura.org

XSEDE Website – http://xsede.org

Workshop materials - http://hpcuniversity.org/trainingMaterials/247/

XSEDE

Extreme Science and Engineering Discovery Environment

Welcome to XSEDE!